REMARKS

Reconsideration of the application is requested. To address wording concerns, Claims 1-2 were cancelled and new Claims 4-13 were added. New Claim 4 specifies that the sintering aids comprise Al_2O_3 sintering aids. Support for this limitation is found on page 3, 2nd paragraph as well as the examples. New Claims 5-13 claim the invention of Claim 4 in further detail and support for claims is found in the specification. Originally filed Claim 3 was previously cancelled.

Election

This response affirms Applicants' decision to elect Claim 1 for further prosecution. The election is made without traverse.

Rejection Under 35 USC 112, second paragraph

The Office Action rejected Claim 1 on the grounds that the claim contained certain terms that rendered the claim indefinite. In view of the modifications made above, the rejection is believed overcome. Reconsideration is requested.

Rejection Under 35 USC 102

The Office Action rejected Claim 1 under 35 USC 102 over U.S. 5,804,523 (Oda), U.S. Pat. No. 5,885,916 (Tajima) or U.S. Pat. No. 5,998,319 (Hintermeyer). The rejection should be withdrawn in view of the remarks below, which refer to new Claims 4-13.

It is well settled that a 35 USC 102 rejection must rest upon the literal teachings of the reference and that the teachings must teach every element of the claimed invention in as complete detail as is contained in the claim. In order for prior art reference to anticipate claim, the reference must disclose each and every element of claim with sufficient clarity to prove its existence in prior art. The disclosure requirement under 35 USC 102 presupposes knowledge of one skilled in art of claimed invention, but such presumed knowledge does not grant license to read into prior art reference teachings that are not there. See *Motorola Inc. v. Interdigital Technology Corp.* 43 USPQ2d 1481, 1490 (1997 CAFC).

Applicants' invention now relates to a silicon nitride material comprising sintering aids including at least Al_2O_3 and silicon dioxide in a grain boundary phase. The silicon dioxide in the grain boundary phase and the

sintering aids including at least Al_2O_3 in the grain boundary phase have a molar ratio of silicon dioxide to the silicon dioxide and sintering aids including at least Al_2O_3 that is > 60% and the oxide nitride content is < 1%.

Oda

Oda discloses a sintered product of silicon nitride containing no less than 70 mol % of a β-silicon nitride as well as an element of the Group 3a at least including Lu of periodic table and impurity oxygen (Col. 2, ll. 44-48). A principal object of Oda was to provide a material with excellent resistance against oxidation, even at high temperatures (See Abstract). To achieve this object, Oda discloses avoiding a low-melting oxide such as Al_2O_3 (See Col.1, ll. 33-40). Oda discloses replacing Al_2O_3 by an oxide of an element of the Group 3a of periodic table (See Claim 1).

Oda disloses that the content of the element of the Group 3a of periodic table and the content of the impurity oxygen are, respectively, expressed as the amount of an oxide of the element of the Group 3a of periodic table (RE_2O_3) as the amount of SiO_2 of impurity oxygen, such that their total amount is from 2 to 30 mol % (Col. 2, ll. 48-53). The molar ratio (SiO_2 /RE_2O_3) of the amount of the element of the Group 3a of periodic table "reckoned" as the oxide (RE_2O_3) to the amount of impurity oxygen as SiO_2 is from 1.6 to 10, and the intergranular phase of the sintered product chiefly comprises a crystal phase consisting of the element of the Group 3a of periodic table, silicon and oxygen (Col. 2, ll. 53-60).

Oda does not anticipate Applicants' invention. Oda's sintered product of silicon nitride containing no less than 70 mol % of a β-silicon nitride as well as an element of the Group 3a does not disclose Applicants' silicon nitride material comprising sintering aids including at least Al_2O_3 and silicon dioxide in a grain boundary phase. Oda's discosure that the molar ratio (SiO_2 /RE_2O_3) of the amount of the element of the Group 3a of periodic table "reckoned" as the oxide (RE_2O_3) to the amount of impurity oxygen as SiO_2 is from 1.6 to 10, and its intergranular phase does not disclose Applicants' material which requires that the silicon dioxide in the grain boundary phase and the sintering aids including at least Al_2O_3 in the grain boundary phase have a molar ratio of silicon dioxide to the silicon dioxide and sintering aids including at least Al_2O_3 that is > 60% and the oxide nitride content is < 1%.

Oda's discussion of the drawbacks of the presence of oxide nitride (Si_2N_2O) (See Col. 6, ll. 51-54) does not disclose Applicants' material, which requires the oxide nitride content is limited to a value below 1%. In other words, Oda does not disclose each and every element of claims 4-13 with sufficient clarity to prove the existence of Applicants' invention in the prior art. Applicants request that the USPTO acknowledge the differences between Applicants' invention and Oda and withdraw the rejection.

Tajima

Tajima discloses a dielectric material that has a low dielectric loss factor. The material comprises a sintered product of silicon nitride that contains aluminum in an amount which is not larger than 2 % by weight (Abstract). A principal object of Tajima was to suppress the amount of aluminum (Col. 3, ll. 38-42), preferably to a content below 0.1% by weight (Claim 2 and Col. 4, ll. 61-65). Tajima is silent about the drawbacks of the presence of oxide nitride (Si_2N_2O). In fact, many of the materials according to Tajima's examples contain a crystalline phase of oxide nitride (Si_2N_2O) (See Table 2, examples 1-26 to 1-33, where crystalline phase of oxide nitride is indicated by the abbreviation SNO).

Tajima does not disclose Applicants' invention. Tajima's low dielectric material comprising a sintered product of silicon nitride that contains aluminum in an amount which is not larger than 2 % by weight does not disclose Applicants' silicon nitride material comprising sintering aids including at least Al_2O_3, and silicon dioxide, in a grain boundary phase. Tajima's silence about the drawbacks of the presence of oxide nitride does not disclose Applicants' material, which requires the oxide nitride content to less than 1 %. In fact, such teachings clearly indicate Tajima is fundamentally different from Applicants' invention. Reconsideration is requested.

Hintermeyer

Hintermeyer is not prior art under 35 USC 102(e). Applicants' priority date for this Application is October 20, 1997- before June 10, 1998, the 35 USC 102(e) and the 35 USC 371 dates of Hintermeyer. Applicants will

submit a translation of the priority document and submit it to the USPTO when it is available.

Rejection Under 35 USC 103

The Office Action rejected Claim 1 over U.S. 5,804,523 (Oda), U.S. Pat. No. 5,885,916 (Tajima) or U.S. Pat. No. 5,998,319 (Hintermeyer). The rejection should be withdrawn in view of the remarks below.

It is well established that to establish a *prima facie* case of obviousness, the USPTO must satisfy all of the following requirements. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references (*In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988)). Second, the proposed modification must have had a reasonable expectation of success, as determined from the vantage point of one of ordinary skill in the art at the time the invention was made (*Amgen v. Chugai Pharmaceutical Co.* 18 USPQ 2d 1016, 1023 (Fed Cir, 1991), *cert. denied* 502 U.S. 856 (1991)). Third, the prior art reference or combination of references must teach or suggest all of the limitations of the claims (*In re Wilson*, 165 USPQ 494, 496, (CCPA 1970)). In view of the modifications above, the Office Action did not establish a *prima facie* case of obviousness.

Applicants' invention now relates to a silicon nitride material comprising sintering aids including at least Al_2O_3, and silicon dioxide, in a grain boundary phase. The silicon dioxide in the grain boundary phase and the sintering aids including at least Al_2O_3 in the grain boundary phase have a molar ratio of silicon dioxide to the silicon dioxide and sintering aids including at least Al_2O_3 that is > 60% and the oxide nitride content is < 1%. Applicants' invention is based on the discovery that the silicon material has, regardless of the way in which it is produced, a high corrosion resistance towards acids if it has a very high SiO_2 content and formation of silicon oxide nitride is avoided (Spec., p. 2, 3rd full paragraph).

Oda

Oda teaches a sintered product of silicon nitride containing not smaller than 70 mol % of a β-silicon nitride as well as an element of the Group 3a at least including Lu of periodic table and impurity oxygen. A principal object of

Oda was to provide a material with excellent resistance against oxidation, even at high temperatures. To achieve this object, use of a low-melting oxide such as Al_2O_3 must be avoided. As such, Oda discloses replacing Al_2O_3 by an oxide of an element of the Group 3a of periodic table. Further, although Oda discusses the drawbacks of the presence of oxide nitride (Si_2N_2O) (See. Col. 6, ll. 51-54), there is no teaching that this content is limited to a value below 1% as required by Applicants' invention.

One of ordinary skill in the art following the teachings of Oda would not have been motivated to modify Oda, make Applicant's invention, and expect the results Applicants have obtained. Oda's intent to provide a material with excellent resistance against oxidation at high temperatures by avoiding a low-melting oxide such as Al_2O_3 would have taught away from Applicants' invention, which requires sintering aids including at least Al_2O_3. Oda's teachings that Al_2O_3 is replaced with an oxide of an element of the Group 3a of periodic table would have taught away from Applicants' materials comprising at least Al_2O_3 sintering aids. Oda's teachings about drawbacks of the presence of oxide nitride (Si_2N_2O) are vague and ambiguous such that they would not have encouraged an artisan following the teachings of Oda to modify Oda, and make Applicants' material, which requires that the oxide nitride content should be < 1%. In view of such non-suggestive teachings, Oda does not support the rejection. Applicants request that the USPTO acknowledge the differences between Applicants' invention and Oda and withdraw the rejection.

Tajima

Tajima teaches a dielectric material that has a low dielectric loss factor. The material comprises a sintered product of silicon nitride that contains aluminum in an amount, which is not larger than 2 % by weight. A principal object of Tajima was to suppress the amount of aluminum, preferably to a content below 0.1% by weight. Tajima is silent about the drawbacks of the presence of oxide nitride (Si_2N_2O). In fact, many of the materials according to Tajima's examples contain a crystalline phase of oxide nitride (Si_2N_2O) (See Table 2, examples 1-26 to 1-33: crystalline phase of oxide nitride is indicated by the abbreviation SNO).

Tajima does not have teachings that would have motivated one of ordinary skill in the art following the teachings of Tajima to modify Tajima, make Applicant's invention, and expect the results Applicants have obtained. Tajima's principal object to suppress the amount of aluminum to a preferred content below 0.1% by weight would have taught away from Applicants' invention which requires an Al_2O_3 sintering aid. Tajima's silence about the drawbacks of the presence of oxide nitride (Si_2N_2O) and its examples containing a crystalline phase of oxide nitride would not have been suggestive of Applicants' invention, which requires that the oxide nitride content is < 1%. In other words, Tajima and Applicants' invention are different. Applicant's request that the USPTO recognize the differences between their invention and Tajima, acknowledge that these differences are sufficiently great to meet the requirements of 35 USC 103, and withdraw the rejection under 35 USC 103.

Hintermeyer

In view of the comments above concerning Hintermeyer, Hintermeyer is not prior art under 35 USC 103 and the rejection is believed moot. Applicants will forward a translation of the priority documents when it is available. Reconsideration is requested.

Although the Office Action rejected Applicants' invention over Oda, Tajima, and Hintermeyer, individually, Oda, Tajima or Hintermeyer, if combined, would not have motivated one of ordinary skill in the art to make Applicants' invention, modify their combined teachings, and expect the success Applicants have obtained.

It is well established that in a sense, virtually all inventions are combinations of old elements (*In re Rouffet*, 47 USPQ2d 1453, 1457), and that the USPTO may often find every element of a claimed invention in the prior art (*In re Rouffet*, 47 USPQ2d 1457). If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue (*In re Rouffet* at 1457). In view of the remarks and modifications and remarks above, Applicants request that the USPTO recognize the differences that exist between their invention and the cited documents, acknowledge that these differences are sufficient to meet the requirements of 35 USC 103, and allow new Claims 4-13.

In view of the modifications and remarks above, allowance of new Claims 4-13 is earnestly requested.

Respectfully submitted,

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MARKED UP VERSION TO SHOW CHANGES

As explicitly set forth in **37 C.F.R. S ction 1.121(c)(1)(ii), last sent nc** , a marked up version does not have to be supplied for an added claim or a cancelled claim as it is sufficient to state that a particular claim has been added, or cancelled, and this has been so stated in the Amendment.